

WHAT IS CLAIMED IS:

1           1. A method for reducing a condition associated with fetal alcohol  
2 syndrome in a subject who is exposed to alcohol *in utero*, the method comprising  
3 administering to the subject an ADNF polypeptide in an amount sufficient to reduce the  
4 condition associated with fetal alcohol syndrome.

1           2. The method of claim 1, wherein the ADNF polypeptide is a  
2 member selected from the group consisting of:

3           (a) an ADNF I polypeptide comprising an active core site having the  
4 following amino acid sequence:

5           Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:1);

6           (b) an ADNF III polypeptide comprising an active core site having the  
7 following amino acid sequence:

8           Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln (SEQ ID NO:2); and

9           (c) a mixture of the ADNF I polypeptide of part (a) and the ADNF III  
10 polypeptide of part (b).

1           3. The method of claim 1, wherein the ADNF polypeptide is a  
2 member selected from the group consisting of a full length ADNF I polypeptide, a full  
3 length ADNF III polypeptide, and a mixture of a full length ADNF I polypeptide and a  
4 full length ADNF III polypeptide.

1           4. The method of claim 1, wherein the ADNF polypeptide is an  
2 ADNF I polypeptide.

1           5. The method of claim 4, wherein the ADNF I polypeptide is Ser-  
2 Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:1).

1           6. The method of claim 4, wherein the ADNF I polypeptide is  
2 selected from the group consisting of:

3           Val-Leu-Gly-Gly-Gly- Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:14);

4           Val-Glu-Glu-Gly-Ile-Val-Leu-Gly-Gly-Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-  
5 Ala (SEQ ID NO:15);

6           Leu-Gly-Gly-Gly- Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:16);

7        Gly-Gly-Gly-Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:17);  
8        Gly-Gly-Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:18); and  
9        Gly- Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:19).

1              7.        The method of claim 4, wherein the ADNF I polypeptide  
2        comprises up to about 20 amino acids at at least one of the N-terminus and the C-terminus  
3        of the active core site.

1              8.        The method of claim 1, wherein the ADNF polypeptide is an  
2        ADNF III polypeptide.

1              9.        The method of claim 8, wherein the ADNF III polypeptide is Asn-  
2        Ala-Pro-Val-Ser-Ile-Pro-Gln (SEQ ID NO:2).

1              10.      The method of claim 8, wherein the ADNF III polypeptide is  
2        selected from the group consisting of:

3        Gly-Gly-Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln (SEQ ID NO:20);  
4        Leu-Gly-Gly-Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln-Gln-Ser (SEQ ID NO:21);  
5        Leu-Gly-Leu-Gly-Gly-Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln-Gln-Ser (SEQ ID  
6        NO:22); and  
7        Ser-Val-Arg-Leu-Gly-Leu-Gly-Gly-Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln-Gln-Ser  
8        (SEQ ID NO:23).

1              11.      The method of claim 8, wherein the ADNF III polypeptide  
2        comprises up to about 20 amino acids at at least one of the N-terminus and the C-terminus  
3        of the active core site.

1              12.      The method of claim 1, wherein the ADNF polypeptide is a  
2        mixture of an ADNF I polypeptide of part (a) and an ADNF III polypeptide of part (b).

1              13.      The method of claim 12, wherein the ADNF I polypeptide is Ser-  
2        Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:1), and wherein the ADNF III  
3        polypeptide is Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln (SEQ ID NO:2).

1              14.      The method of claim 12, wherein the ADNF I polypeptide is  
2        selected from the group consisting of:

3        Val-Leu-Gly-Gly-Gly- Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:14);

4           Val-Glu-Glu-Gly-Ile-Val-Leu-Gly-Gly-Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-  
5           Ala (SEQ ID NO:15);  
6           Leu-Gly-Gly-Gly- Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:16);  
7           Gly-Gly-Gly-Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:17);  
8           Gly-Gly-Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:18);  
9           Gly-Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:19); and  
10          Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:1); and wherein the ADNF III  
11         polypeptide is selected from the group consisting of:  
12          Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln (SEQ ID NO:2);  
13          Gly-Gly-Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln (SEQ ID NO:20);  
14          Leu-Gly-Gly-Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln-Gln-Ser (SEQ ID NO:21);  
15          Leu-Gly-Leu-Gly-Gly-Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln-Gln-Ser (SEQ ID  
16         NO:22); and  
17          Ser-Val-Arg-Leu-Gly-Leu-Gly-Gly-Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln-Gln-Ser  
18         (SEQ ID NO:23).

1           15.       The method of claim 12, wherein the ADNF I polypeptide  
2         comprises up to about 20 amino acids at at least one of the N-terminus and the C-terminus  
3         of the active core site of the ADNF I polypeptide, and wherein the ADNF III polypeptide  
4         comprises up to about 20 amino acids at at least one of the N-terminus and the C-terminus  
5         of the active core site of the ADNF III polypeptide.

1           16.       The method of claim 1, wherein at least one of the ADNF  
2         polypeptide is encoded by a nucleic acid which is administered to the subject.

1           17.       The method of claim 1, wherein the condition is decreased body  
2         weight of the subject.

1           18.       The method of claim 1, wherein the condition is decreased brain  
2         weight of the subject.

1           19.       The method of claim 1, wherein the condition is a decreased level  
2         of VIP mRNA or protein of the subject.

1           20.       The method of claim 1, wherein the condition is decreased viability  
2         of the subject *in utero*.

1                   21. The method of claim 1, wherein the condition is decreased  
2 learning.

1                   22. A method for reducing neuronal cell death, the method comprising  
2 contacting a neuronal cell with a mixture of an ADNF I polypeptide and an ADNF III  
3 polypeptide in an amount sufficient to reduce neuronal cell death,

4                   wherein the ADNF I polypeptide comprises an active core site having the  
5 following amino acid sequence:

6                   Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:1); and

7                   wherein the ADNF III polypeptide comprises an active core site having the  
8 following amino acid sequence:

9                   Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln (SEQ ID NO:2).

1                   23. The method of claim 22, wherein the ADNF I polypeptide is a full  
2 length ADNF I polypeptide and the ADNF III polypeptide is a full length ADNF III  
3 polypeptide.

1                   24. The method of claim 22, wherein the ADNF I polypeptide is Ser-  
2 Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:1), and wherein the ADNF III  
3 polypeptide is Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln (SEQ ID NO:2).

1                   25. The method of claim 22, wherein the ADNF I polypeptide is  
2 selected from the group consisting of:

3                   Val-Leu-Gly-Gly-Gly- Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:14);

4                   Val-Glu-Glu-Gly-Ile-Val-Leu-Gly-Gly-Gly-Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-  
5 Ala (SEQ ID NO:15);

6                   Leu-Gly-Gly-Gly- Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:16);

7                   Gly-Gly-Gly-Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:17);

8                   Gly-Gly-Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:18);

9                   Gly-Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:19); and

10                  Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:1); and wherein the ADNF III  
11 polypeptide is selected from the group consisting of:

12                  Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln (SEQ ID NO:2);

13                  Gly-Gly-Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln (SEQ ID NO:20);

14                  Leu-Gly-Gly-Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln-Gln-Ser (SEQ ID NO:21);

15       Leu-Gly-Leu-Gly-Gly-Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln-Gln-Ser (SEQ ID  
16       NO:22); and  
17       Ser-Val-Arg-Leu-Gly-Leu-Gly-Gly-Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln-Gln-Ser  
18       (SEQ ID NO:23).

1           26.      The method of claim 22, wherein the ADNF I polypeptide  
2      comprises up to about 20 amino acids at at least one of the N-terminus and the C-terminus  
3      of the active core site of the ADNF I polypeptide, and wherein the ADNF III polypeptide  
4      comprises up to about 20 amino acids at at least one of the N-terminus and the C-terminus  
5      of the active core site of the ADNF III polypeptide.

1           27.      The method of claim 22, wherein at least one of the ADNF  
2      polypeptide is encoded by a nucleic acid.

1           28.      A pharmaceutical composition comprising a pharmaceutically  
2      acceptable excipient and a mixture of an ADNF I polypeptide and an ADNF III  
3      polypeptide, wherein the ADNF I polypeptide comprises an active core site having the  
4      following amino acid sequence:

5           Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:1); and  
6      wherein the ADNF III polypeptide comprises an active core site having the following  
7      amino acid sequence:

8           Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln (SEQ ID NO:2).

1           29.      The pharmaceutical composition of claim 28, wherein the ADNF I  
2      polypeptide is a full length ADNF I polypeptide and the ADNF III polypeptide is a full  
3      length ADNF III polypeptide.

1           30.      The pharmaceutical composition of claim 28, wherein the ADNF I  
2      polypeptide is Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:1), and wherein the  
3      ADNF III polypeptide is Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln (SEQ ID NO:2).

1           31.      The pharmaceutical composition of claim 28, wherein the ADNF I  
2      polypeptide is selected from the group consisting of:

3           Val-Leu-Gly-Gly-Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:14);  
4           Val-Glu-Glu-Gly-Ile-Val-Leu-Gly-Gly-Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-  
5           Ala (SEQ ID NO:15);

6           Leu-Gly-Gly-Gly-Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:16);  
7           Gly-Gly-Gly-Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:17);  
8           Gly-Gly-Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:18)  
9           Gly-Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:19); and  
10          Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:1); and wherein the ADNF III  
11         polypeptide is selected from the group consisting of:  
12          Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln (SEQ ID NO:2)  
13          Gly-Gly-Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln (SEQ ID NO:20);  
14          Leu-Gly-Gly-Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln-Gln-Ser (SEQ ID NO:21);  
15          Leu-Gly-Leu-Gly-Gly-Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln-Gln-Ser (SEQ ID  
16         NO:22); and  
17          Ser-Val-Arg-Leu-Gly-Leu-Gly-Gly-Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln-Gln-Ser  
18         (SEQ ID NO:23).

1           32.       The pharmaceutical composition of claim 28, wherein the ADNF I  
2         polypeptide comprises up to about 20 amino acids at at least one of the N-terminus and  
3         the C-terminus of the active core site of the ADNF I polypeptide, and wherein the ADNF  
4         III polypeptide comprises up to about 20 amino acids at at least one of the N-terminus and  
5         the C-terminus of the active core site of the ADNF III polypeptide.

1           33.       The pharmaceutical composition of claim 28, wherein at least one  
2         of the ADNF polypeptide is encoded by a nucleic acid.